

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-26 (Previously Cancelled)

27. (Previously Added) An in vivo surgical method of treating a patient comprising:

inserting an aspiration cannula through the patient's epidermis, so that a distal end of the cannula is positioned in close proximity to an area of tissue, the cannula being provided with a cannula lumen in communication with the cannula distal end;

transmitting air and fluid through a fluid and energy guide, the fluid and energy guide longitudinally extending within the cannula lumen;

generating atomized fluid particles in an interaction zone located in close proximity to the cannula distal end, using the air and fluid transmitted through the fluid and energy guide;

providing electromagnetic energy from an energy source to an electromagnetic energy transmitter operatively mounted within the fluid and energy guide;

transmitting the electromagnetic energy from an output end of the energy transmitter into the interaction zone, the electromagnetic energy having a wavelength which is substantially absorbed by a portion of atomized fluid particles in the interaction zone, the absorption of the electromagnetic energy by the portion of atomized fluid particles causing the portion of atomized fluid particles to expand and impart disruptive cutting forces onto the portion of the area of tissue in close proximity to the cannula distal end; and

providing a source of aspiration at a proximal end of the cannula, wherein the source of aspiration is configured to aspirate air and water from the fluid and energy guide, and tissue debris from within the cannula, through the cannula distal end and the cannula.

28. (Previously Added) The method according to claim 27, wherein the tissue comprises joint tissue.

29. (Previously Added) The method according to claim 27, wherein the tissue is located within the head, the eye, the trachea or the abdomen.

30. (Previously Added) The method according to claim 27, wherein the cannula distal end is generally rounded or bullet-shaped to facilitate insertion into the patient's tissue with a minimum of localized tissue trauma.

31. (Previously Added) The method according to claim 27, wherein:
the generating of atomized fluid particles comprises generating atomized water particles;

the providing of electromagnetic energy from an energy source comprises providing laser energy from an erbium, chromium, yttrium, scandium, gallium garnet (Er, Cr:YSGG) solid state laser; and

the absorption of the electromagnetic energy by the portion of atomized water particles causes the portion of atomized water particles to expand and impart disruptive cutting forces onto the portion of the area of tissue in close proximity to the cannula distal end.

32. (Previously Added) The method according to claim 27, wherein:
the generating of atomized fluid particles comprises generating atomized water particles;

the providing of electromagnetic energy from an energy source comprises providing laser energy from a CO₂ laser; and

the absorption of the electromagnetic energy by the portion of atomized water particles causes the portion of atomized water particles to expand and impart disruptive cutting forces onto the portion of the area of tissue in close proximity to the cannula distal end.

33. (Previously Added) The method according to claim 27, wherein the fluid comprises water.

34. (Previously Added) The method according to claim 27, wherein the fluid comprises an anesthetic.

35. (Previously Added) The method according to claim 27, wherein the fluid comprises a saline solution.

36. (Previously Added) The method according to claim 27, wherein the fluid comprises sterile fluid.

37. (Previously Added) The method according to claim 27, wherein the fluid comprises epinephrine.

38. (Previously Added) A tissue remover comprising:

an aspiration cannula having a cannula proximal end and a cannula distal end, the cannula being provided with a cannula lumen in communication with the cannula distal end, the cannula distal end being adapted to receive soft or hard tissue therein and into the cannula lumen;

a fluid and energy guide disposed within the cannula and longitudinally extending within the cannula lumen, the fluid and energy guide transporting air and

fluid to a distal end of the fluid and energy guide and being adapted to generate atomized fluid particles in an interaction zone located in close proximity to the distal end of the fluid and energy guide near the cannula distal end, the fluid and energy guide further providing electromagnetic energy from an energy source to an electromagnetic energy transmitter operatively mounted within the fluid and energy guide, the electromagnetic energy having a wavelength which is substantially absorbed by a portion of atomized fluid particles in the interaction zone, the absorption of the electromagnetic energy by the portion of atomized fluid particles causing the portion of atomized fluid particles to expand and impart disruptive cutting forces onto soft or hard tissue in close proximity with the cannula distal end; and

a source of aspiration connected to a proximal end of the cannula, the source of aspiration being configured to aspirate air and fluid from the fluid and energy guide, and soft or hard tissue from within the cannula, through the cannula distal end and the cannula.

39. (Previously Added) The tissue remover according to claim 38, wherein the electromagnetic energy source comprises an erbium, chromium, yttrium, scandium, gallium garnet (Er, Cr:YSGG) solid state laser.

40. (Previously Added) The tissue remover according to claim 38, wherein the electromagnetic energy source comprises a CO₂ laser.

41. (Previously Added) The tissue remover according to claim 38, wherein the aspiration cannula is formed of a medical grade plastic.

42. (Previously Added) The tissue remover according to claim 38, wherein the aspiration cannula is formed of a stainless steel.

43. (Previously Added) The tissue remover according to claim 38, wherein the electromagnetic energy transmitter is a fiber optic delivery system.

44. (Previously Added) The tissue remover according to claim 38, wherein the fluid comprises water.

45. (Previously Added) The tissue remover according to claim 38, wherein the fluid comprises an anesthetic.

46. (Previously Added) The tissue remover according to claim 38, wherein the fluid comprises a saline solution.

47. (Previously Added) The tissue remover according to claim 38, wherein the fluid comprises sterile fluid.

48. (Previously Added) The tissue remover according to claim 38, wherein the fluid comprises epinephrine.

49. (Previously Added) The method according to claim 27, wherein the tissue comprises soft tissue, cartilage or bone.

50. (Previously Added) The method according to claim 27, wherein:

the generating of atomized fluid particles comprises generating atomized water particles;

the providing of electromagnetic energy from an energy source comprises providing laser energy from an Er:YAG laser; and

the absorption of the electromagnetic energy by the portion of atomized water particles causing the portion of atomized water particles to expand and impart disruptive cutting forces onto the portion of the area of tissue in close proximity to

the cannula distal end.

51. (Previously Added) The method according to claim 27, wherein the fluid comprises epinephrine and an anesthetic.

52. (Previously Added) The tissue remover according to claim 38, wherein the energy source comprises an ER:YAG laser.

53. (Previously Added) The tissue remover according to claim 38, wherein the fluid comprises epinephrine and an anesthetic.

54. (Previously Added) A tissue remover comprising:

a tissue remover cannula having a cannula proximal end and a cannula distal end, the cannula being provided with a cannula lumen in communication with the cannula distal end, the cannula distal end being adapted to receive soft or hard tissue therein and into the cannula lumen;

an imager, the imager being adapted to provide an image to a user of an area in proximity to the cannula distal end;

a fluid and energy guide disposed within the cannula, the fluid and energy guide transporting air and fluid to a distal end of the fluid and energy guide and being adapted to generate fluid particles in an interaction zone located in close proximity to the distal end of the fluid and energy guide near the cannula distal end, the fluid and energy guide further providing electromagnetic energy from an energy source to an electromagnetic energy transmitter within the fluid and energy guide, the electromagnetic energy having a wavelength which is substantially absorbed by a portion of fluid particles in the interaction zone, the absorption of the electromagnetic energy by the portion of fluid particles causing the portion of fluid particles to expand and impart disruptive cutting forces onto soft or hard tissue in close proximity with the cannula distal end; and.

a source of aspiration connected to a proximal end of the cannula, the source of aspiration being configured to aspirate air and fluid from the fluid and energy guide, and tissue debris from within the cannula, through the cannula distal end and the cannula.

55. (Previously Added) The tissue remover as set forth in Claim 54, wherein the energy source comprises an Er, Cr:YSGG laser.

56. (Previously Added) The tissue remover as set forth in Claim 54, wherein the energy source comprises an infrared laser and the imager comprises an infrared imager.

57. (Previously Added) The tissue remover as set forth in Claim 54, wherein the imager is disposed within the tissue remover.

58. (Previously Added) The tissue remover as set forth in Claim 54, wherein the imager is disposed within the cannula lumen.

59. (Previously Added) The tissue remover as set forth in Claim 56, wherein the imager maps temperature differences of tissue in close proximity with the cannula distal end by detecting electromagnetic radiation from tissue that is at different temperatures from its surroundings.

60. (New) The tissue remover according to claim 36, wherein the sterile fluid comprises water.

61. (New) The tissue remover according to claim 36, wherein the sterile fluid

comprises an anesthetic.

62. (New) The tissue remover according to claim 36, wherein the sterile fluid comprises a saline solution.

63. (New) The tissue remover according to claim 36, wherein the sterile fluid comprises epinephrine.

64. (New) The tissue remover according to claim 63, wherein the sterile fluid further comprises an anesthetic.

65. (New) The tissue remover according to claim 47, wherein the sterile fluid comprises water.

66. (New) The tissue remover according to claim 47, wherein the sterile fluid comprises an anesthetic.

67. (New) The tissue remover according to claim 47, wherein the sterile fluid comprises a saline solution.

68. (New) The tissue remover according to claim 47, wherein the sterile fluid comprises epinephrine.

69. (New) The tissue remover according to claim 47, wherein the sterile fluid further comprises an anesthetic.